

EXHIBIT "A"

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Ayazi, *et al.*

Serial No.: **10/632,176**

Filed: **July 31, 2003**

Confirmation No.: **9833**

Group Art Unit: **2811**

Examiner: **Kang, Donghee**

Docket No. **062020-1440**

For: **Capacitive Resonators And Methods Of Fabrication**

DECLARATION OF FARROKH AYAZI

UNDER 37 C.F.R. 1.132

Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

I, **Farrokh Ayazi**, declare as follows:

Education and Experience

1. I am one of the inventors of the above-identified patent application and an employee of the assignee of that application.

2. I graduated with M.S. and Ph.D. degrees in electrical engineering from the University of Michigan, Ann Arbor, in 1997 and 2000, respectively.

3. My research interest over the past 10 years has been in the areas of microfabrication technologies, low and high frequency micro and nano electromechanical resonators, RF MEMS, and MEMS inertial sensors. My research has included more than 60

publications in reputable conferences and journals, one patent and more than 6 pending patent applications.

4. Through my education and work in MEMS research, I have gained extensive experience with MEMS fabrication methods and devices.

The No and Lin References

5. The Patent Examiner who is responsible for examining the above-noted patent application had the following comments to make in Page 6 of the Detailed Action in the Office Action mailed 5/10/2005:

No et al. does not explicitly teach the semiconductor-on-insulator (SOI) substrate. However, Lin et al. teach forming resonator structure on SOI substrate by removing oxide of the SOI substrate to prevent stiction by preventing the microstructure from falling down onto the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form MEMS resonator of No on SOI structure as taught by Lin since SOI structures prevents microstructure from falling down onto the substrate hence improving the micromachining process.

6. Upon information and belief, I believe that one having ordinary skill in the art, such as myself, would find nothing in *No* to teach or suggest SOI-technology. Quite the contrary, *No* (page 493 of *No*) emphasizes the benefits of an all-silicon structure, and in particular states that such a structure “translates to potentially better temperature and long-term mechanical stability of the fabricated resonators.”

7. Upon information and belief, I believe that *Lin* teaches an SOI-based technology.

8. Upon information and belief, I believe that the processing described in *No* would be recognized by one having ordinary skill in the art, such as myself, as unsuitable in SOI-based processes.

9. Upon information and belief, I believe one example of the unsuitability of *No* to SOI-based processes can be found in what *No* teaches (page 492) with regard to trench height:

High aspect ratio trenches that are 2-5 um wide are etched into the substrate using the Bosch process...The height of the trenches will determine the height of the resonators.

Upon information and belief, I believe that one having ordinary skill in the art, such as myself, would recognize this teaching of *No* to be in contrast to SOI processing since one having ordinary skill in the art, such as myself, would know that device height in SOI processing is limited to the thickness of the upper silicon layer, not the height of the trench. In other words, if the height of the trench is limited only by the depth of the etch, as taught by *No*, this is in contrast to SOI processing where the height of the device is limited by the thickness of the upper silicon layer.

10. Upon information and belief, I believe that one having ordinary skill in the art, such as myself, would recognize another example of the unsuitability of *No* to SOI-based processes in the forming/removing steps found in the independent claims. In particular, applying the steps of "forming release openings and removing the polysilicon and at least a portion of the semiconductor-on-silicon substrate" to *No* and then performing an undercut in *No* would likely result in etching away the electrodes and/or resonator in *No* and yielding an inoperative device.

11. Based on the foregoing, and upon information and belief, I submit that one having ordinary skill in the art of MEMs technology, such as myself, would not find a suggestion or motivation to combine the teachings of *Lin* with *No*.



DECLARATION

I hereby declare that all statements made herein are of my own knowledge are true and that all statements are made on information and belief and are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

F. Ayazi

Farrokh Ayazi

Aug. 10th, 2005

Date .